DETAILED ACTION

1. This Office Action is responsive to the amendment filed on 4/16/2010.

2. The objections and rejections not addressed below are deemed withdrawn.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Election/Restrictions

4. Claim 9 is allowable over the prior art. The restriction requirement between the inventions of Groups III and IV and the requirement for election of species, as set forth in the Office action mailed on 9/21/2009, have been reconsidered in view of the allowability of claims to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable claim.** Claims 13, 15, and 24-26, directed to species (claims 13, 15, 24, 25) and an invention (claim 26) are no longer withdrawn from consideration because the claim(s) requires all the limitations of an allowable claim.

In view of the above noted withdrawal of the restriction requirement, applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 33 and 36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

7. Regarding claim 33, the limitation stating that the claimed copolymer's polydispersity (M_w/M_n) is "1.3 or greater" is an open-ended range that reads on any value greater than or equal to 1.3; the original disclosure teaches that polydispersity falls within ranges, with a maximum value of 5.0 being disclosed (see specification: page 11, lines 7-11; page 72, lines 7-11). The original disclosure does not provide support for the open-ended range recited in the instant claim.

8. Regarding claim 36, the claimed formula is discussed in the specification at page 12, lines 5-20. The original disclosure only uses "i" to refer to an individual catalyst, as in the phrase "... propagation with respect to block sequences from catalyst i" in lines 9-

10. The original disclosure does not define i as an integer, and does not provide support for the open-ended range that i is “at least 2”.

9. Claims 9-18 and 20-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Independent claims 9, 34, and 36 all recite the limitation "segmented blocks;" this limitation is inherited by all dependent claims. The term "segment" is used as a synonym for the word "block" throughout the specification in describing the claimed block copolymer; similarly, “segmented copolymer” is used interchangeably with “block copolymer”. As the two words are used to describe the same concept, it is unclear from the specification what structure the limitation “segmented blocks” is intended to describe. For the purposes of examination, the claim has been interpreted to require that the blocks are well defined, as stated in the specification (page 3, lines 1-3).

10. Claim 26 recites the limitation “preparable by the method of claim 8.” Claim 8 has been canceled; it is therefore unclear what combination of limitations this limitation is intended to recite. For purposes of examination on the merits, the claim has therefore only been treated with respect to its dependency from any one of claims 9 to 25.

11. Claim 36 does not define the variable $X_i[n]$ from the claimed formula, rendering the claim indefinite. Based on the specification, the variable has been interpreted as the fraction of sequences of length n polymerized from a catalyst i.

Claim Rejections - 35 USC § 103

12. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner et al, US5391629 (of record), in view of Haruna et al, US5077328.

13. As discussed in the previous Office Action, incorporated herein by reference, Example 8 of Turner discloses an ethylene/propylene block copolymer which corresponds to the claimed ethylene/olefin multiblock copolymer containing two blocks characterized by different comonomer contents (for claim 33). Regarding the limitation of "segmented blocks" Example 8 of Turner is prepared via a living polymerization process, wherein the monomers used to prepare the second block are not added to the reactor until the monomers used to prepare the first block are completely consumed (Column 10, lines 37-39), resulting in well-defined separation of blocks.

14. Turner is silent regarding the addition of zinc.

15. Haruna discloses that it commonly known in the field of polymer chemistry to add inorganic fillers such as zinc oxide (for claim 34) to polyolefin resins) to improve properties such as tensile strength (Column 1, lines 25-29; Column 3, lines 24-34). Said polyolefin may be a block copolymer prepared from α-olefins such as ethylene and propylene (Column 4, lines 62-64).

16. Turner discloses that the block copolymer of US5391629 may be combined with fillers (Column 7, lines 30-40). It therefore would have obvious to one of ordinary skill in the art at the time the invention was made to modify the ethylene/propylene block copolymer of Turner by adding zinc oxide, taught by Haruna to be a known filler for

polyolefin resins, in order to a final polymer resin having improved tensile properties. Said final polymer resin would be a zinc-containing block copolymer.

17. Both Turner and Haruna are silent regarding the microcrystalline order of the multi-block copolymer; however, as described above and in paragraphs 20-21 of the previous Office Action, the block copolymer of Turner is characterized by similar 1) structure, 2) monomeric composition, and 3) properties as the block copolymer recited in claim 34 and described by applicant in the instant specification. The examiner therefore takes the position that the properties of the prior art block copolymer would necessarily be the same as claimed and inherently not be different from those of the claimed invention. Applicant is therefore required to provide factual evidence demonstrating that the properties used to defined the claimed multi-block copolymer are not inherently met by the prior art.

18. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cozewith et al, US5798420 (of record), in view of Haruna et al, US5077328.

19. As discussed in the previous Office Action, incorporated herein by reference, Example 1 of Cozewith '420 discloses an ethylene/propylene block copolymer which corresponds to the claimed ethylene/olefin multiblock copolymer containing two blocks characterized by different comonomer contents (for claim 34).

20. Cozewith '420 is silent regarding the addition of zinc.

21. The disclosure of Haruna is discussed earlier in this Office Action (for claim 34).

22. As taught by Haruna, it was known in the art to add zinc oxide as a filler to polyolefin block copolymers in order to improve the tensile properties of the final resin product. It therefore would have been obvious to one of ordinary skill in the art at the time the invention was made to add zinc oxide to the block copolymer of Cozewith '420, in order to produce a polymer composition having improved tensile properties. Said polymer composition would be a zinc-containing block copolymer.

23. Both Cozewith '420 and Haruna are silent regarding the microcrystalline order of the multi-block copolymer; however, as described above and in the previous Office Action, the block copolymer of Cozewith '420 is characterized by similar 1) structure, 2) monomeric composition, and 3) properties as the block copolymer recited in claim 34 and described by applicant in the instant specification. The examiner therefore takes the position that the properties of the prior art block copolymer would necessarily be the same as claimed and inherently not be different from those of the claimed invention. Applicant is therefore required to provide factual evidence demonstrating that the properties used to defined the claimed multi-block copolymer are not inherently met by the prior art.

24. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cozewith et al, US5733980 (of record), in view of Haruna et al, US5077328.

25. As discussed in the previous Office Action, incorporated by reference, Examples 1A and 1B of Cozewith'980 disclose ethylene/propylene block copolymers which

correspond to the claimed ethylene/olefin multiblock copolymer containing two blocks characterized by different comonomer contents (for claim 34).

26. Cozewith'980 is silent regarding the addition of zinc.

27. The disclosure of Haruna is discussed earlier in this Office Action (for claim 34).

28. As taught by Haruna, it was known in the art to add zinc oxide as a filler to polyolefin block copolymers in order to improve the tensile properties of the final resin product. It therefore would have been obvious to one of ordinary skill in the art at the time the invention was made to add zinc oxide to the block copolymer of Cozewith'980, in order to produce a polymer composition having improved tensile properties. Said polymer composition would be a zinc-containing block copolymer.

Allowable Subject Matter

29. Claims 9-18 and 20-32 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

30. The following is a statement of reasons for the indication of allowable subject matter: Independent claim 9 recites the following:

> 9. (currently amended) A multi-block copolymer comprising in polymerized form ethylene and one or more copolymerizable comonomers, said copolymer containing therein two or more ~~segments or~~ segmented blocks differing in comonomer content, crystallinity, density, melting point or glass transition temperature; the multi-block copolymer having a polydisperse block number distribution and a polydisperse distribution of block sizes.

31. The closest prior art of record is Turner et al, US5391629, discussed earlier in this Office Action. The prior art does not teach nor does it fairly suggest a block

copolymer characterized by the claimed combination of limitations including the properties of polydisperse distributions of block number and block size.

Response to Arguments

32. Applicant's arguments, see pages 9-10, filed 4/16/2010, with respect to the claimed limitations of polydisperse distributions of block number and block size in invention of independent claim 9 have been fully considered and are persuasive with regards to the rejections over Turner, Cozewith '420, and Cozewith '980. The rejections of claim 9 and its dependent claims have been withdrawn.

33. Neither independent claim 34 nor its dependent claim 35 requires that the block copolymer is characterized by a polydisperse block number distribution or a polydisperse distribution of block sizes; arguments regarding these limitations therefore are not relevant to the patentability of claims 34 and 35.

34. The examiner disagrees with applicant's argument that the prior art block copolymers are tapered structures that do not contain well-defined blocks. Applicant's declaration (see ¶7), submitted 4/16/2010, states that the copolymers of Cozewith '980 and Cozewith '420 are tapered to the same degree as the copolymer of Turner; the examiner's response is therefore directed towards the block copolymer of Turner.

35. The disclosure of Turner states that tapered block copolymers can be produced via the process of US5391629 (Column 6, lines 28-29); however, the prior art does not require that the block copolymers are tapered. Example 8 of Turner (Column 10, lines 35-45), cited above and in the previous Office Action, discloses a block copolymer

prepared in a two step process. In the first step, an ethylene/propylene block is prepared via a process wherein ethylene is metered into a propylene/catalyst mixture in the reactor over a period of time (Column 10, lines 10-20); Turner teaches that this process results in a random copolymer of ethylene and propylene, not a tapered copolymer (Column 6, lines 20-27). Polymerization of the second block is begun only after all of the monomers for the first block are consumed (Column 10, lines 37-39). The block copolymer produced by this method will therefore have a well-defined first block, which is an ethylene/propylene copolymer, and a well-defined second block, which is a high density polyethylene.

36. Regarding applicant's argument of secondary considerations: The allegedly unexpected results are not commensurate in scope with the invention as recited in the claims. Applicant only states that INFUSE™ olefin block copolymer (OBC) corresponds to the multi-block copolymer disclosed and claimed in the instant application (see declaration ¶9 and remarks page 10, section 5); however, the examiner notes that the copy of the award provided in Tab1 of the declaration of Edmund Carnahan describes the INFUSE™ polymer as an OBC featuring alternating hard and soft blocks; the award further attributes the improved properties of INFUSE™ to this alternating sequence of hard and soft blocks. Applicant's arguments (see page 9) appear to attribute the results at least in part to the polydisperse distributions of block size and block number. Independent claim 34 does not require any of these limitations/properties. Applicant therefore has not provided evidence that unexpected results are obtained as a result of the properties/limitations recited in the currently rejected claims.

Conclusion

37. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Lenihan whose telephone number is (571)270-5452. The examiner can normally be reached on Monday through Thursday from 7:30-5:00 PM, and on alternate Fridays from 7:30-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James J. Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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